

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

8 receive said chemical vapor deposition fluid from said inlet nozzle, said throat
9 region configured to maintain a second pressure and second temperature, and
10 having at least one aperture adjacent to said first and second ends sufficient to
11 allow for the mixing of at least one chemical vapor deposition fluid requiring
12 atomization to said chemical vapor deposition carrier fluid; and,
13 an exit nozzle, connected to said throat region at said second end, having a third
14 diameter greater than said second diameter to allow for a substantial decrease in
15 exit pressure, configured to maintain said exit pressure and third temperature for
16 atomized chemical vapor deposition fluids and chemical vapor deposition gases,
17 and adapted to introduce said chemical vapor deposition fluids and said chemical
18 vapor deposition gases in a chemical vapor deposition processing chamber.

21
1 2. (Amended) The apparatus of claim 1 wherein said inlet nozzle having said first
2 diameter is adapted to receive and funnel said chemical vapor deposition carrier fluid to
3 said throat region second diameter, said inlet nozzle narrowing at an angle in the range
4 of forty to sixty degrees.

Sub 97
1 3. (Amended) The apparatus of claim 1 wherein said throat region is configured to
2 operate at a critical Mach number of 1.0.

Subc 2

1 4. (Amended) The apparatus of claim 1 wherein said second pressure and said second
2 temperature are selected to present a condition for atomization of said chemical vapor
3 deposition fluids.

1 5. (Amended) The apparatus of claim 1 wherein said inlet nozzle, throat region, and
2 exit nozzle are adapted to receive at least one of said plurality of chemical vapor
3 deposition fluids as precursors, and at least one of said plurality of chemical vapor
4 deposition fluids as dopants for a chemical vapor deposition process.

Q1 1 6. (Amended) The apparatus of claim 1 wherein said throat region further comprises
2 two or more apertures adjacent to said first and second ends adapted to allow for the
3 mixing of two or more of said plurality of chemical vapor deposition fluids to said
4 chemical vapor deposition carrier fluid, each of said two or more of said plurality of
5 chemical vapor deposition fluids introduced separately through individual apertures.

1 7. (Amended) The apparatus of claim 1 wherein said throat region is configured to
2 maintain said first pressure to be greater than said third pressure to enhance atomization
3 of said chemical vapor deposition fluids with said chemical vapor deposition carrier
4 fluid.

Sub C2

5 8. (Amended) The apparatus of claim 1 wherein said throat region second diameter
6 is adapted such that said second pressure is lower than said first pressure, allowing for
7 chemical vapor deposition fluids to be injected into said throat region.

1 9. (Amended) The apparatus of claim 1 wherein said inlet nozzle is adapted to
2 receive said chemical vapor deposition carrier fluid at a constant flow rate ensuring said
3 second pressure being maintained constant through said throat region.

1 10. (Amended) The apparatus of claim 1 wherein said throat region is adapted to
2 receive said plurality of chemical vapor deposition fluids introduced separately and
3 simultaneously without pre-mixing.

1 11. (Amended) The apparatus of claim 1 further comprising a heater at said exit
2 nozzle for applying heat to said plurality of chemical vapor deposition fluids exiting said
3 exit nozzle.

Sub C3

1 12. (Amended) The apparatus of claim 1 wherein said exit nozzle is adapted to
2 receive from said throat region said chemical vapor deposition carrier fluid and said
3 plurality of chemical vapor deposition fluids mixed and atomized together, said exit

4 nozzle expanding to said third diameter from said throat region second diameter at an
5 angle in the range of twenty to forty degrees.

1 13. (Amended) An apparatus for delivering a plurality of chemical vapor deposition
2 fluids to a chemical vapor deposition chamber comprising:

3 an inlet nozzle having a first diameter adapted to receive one of said plurality of
4 chemical vapor deposition fluids as a chemical vapor deposition carrier fluid, and
5 configured to maintain a first pressure and a first temperature;

6 a throat region having a first and second end, connecting to said inlet nozzle at said
7 first end, having a second diameter less than said first diameter, and adapted to
8 receive said chemical vapor deposition fluid from said inlet nozzle, said throat
9 region configured to maintain a second pressure and second temperature and
10 having at least one aperture adjacent to said first and second ends sufficient to
11 allow for the mixing of at least one of said plurality of chemical vapor deposition
12 fluids to said chemical vapor deposition carrier fluid; and,

13 an exit nozzle, connected to said throat region at said second end, having said second
14 diameter, configured to maintain said second pressure and said second
15 temperature, such that said exit nozzle is an extension of said throat region having
16 the same dimensions as said throat region, and adapted to introduce said chemical
17 vapor deposition fluids and said chemical vapor deposition carrier fluid in a
18 chemical vapor deposition processing chamber.

Subc3

6

1 14. (Amended) The apparatus of claim 13 wherein said inlet nozzle having said first
2 diameter is adapted to receive and funnel said chemical vapor deposition carrier fluid to
3 said throat region second diameter, said inlet nozzle narrowing at an angle in the range
4 of forty to sixty degrees.

Subc4

1 16. (Amended) The apparatus of claim 13 wherein said second pressure and said
2 second temperature are selected to present a condition for atomization of said chemical
3 vapor deposition fluids.

1 17. (Amended) The apparatus of claim 13 wherein said inlet nozzle, throat region,
2 and exit nozzle are adapted to receive at least one of said plurality of chemical vapor
3 deposition fluids as precursors, and at least one of said plurality of chemical vapor
4 deposition fluids as dopants for a chemical vapor deposition process.

1 18. (Amended) The apparatus of claim 13 wherein said throat region further
2 comprises two or more apertures adjacent to said first and second ends adapted to allow
3 for the mixing of two or more of said plurality of chemical vapor deposition fluids to
4 said chemical vapor deposition carrier fluid, each of said two or more of said plurality of
5 chemical vapor deposition fluids introduced separately through individual apertures.

Subct

1 19. (Amended) The apparatus of claim 13 wherein said throat region second diameter
2 is adapted such that said second pressure is lower than said first pressure, allowing for
3 chemical vapor deposition fluids to be injected into said throat region.

a2 1 20. (Amended) The apparatus of claim 13 wherein said inlet nozzle is adapted to
2 receive said chemical vapor deposition carrier fluid at a constant flow rate ensuring said
3 second pressure being maintained constant through said throat region.

1 21. (Amended) The apparatus of claim 13 wherein said throat region is adapted to
2 receive said plurality of chemical vapor deposition fluids introduced separately and
3 simultaneously without pre-mixing.

In the Drawings

Fig. 2 was amended and the changes made are noted thereon in red.

Fig. 6 is enclosed which was not submitted previously in error.